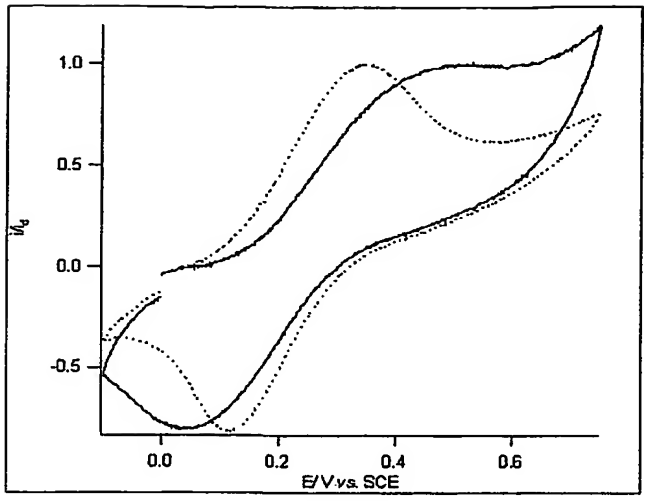


Figure 1

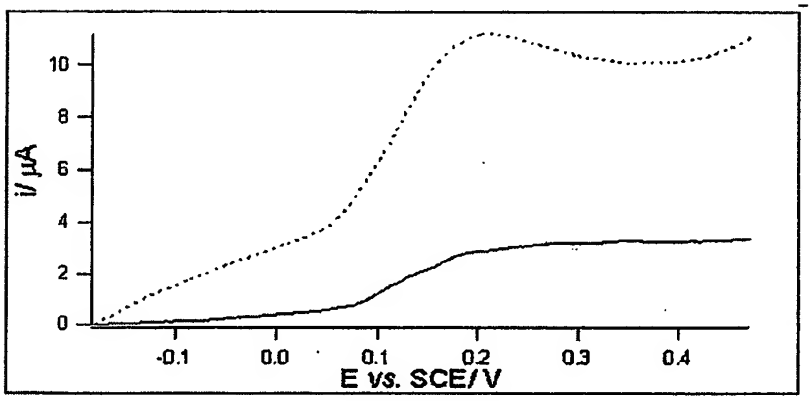


Figure 2

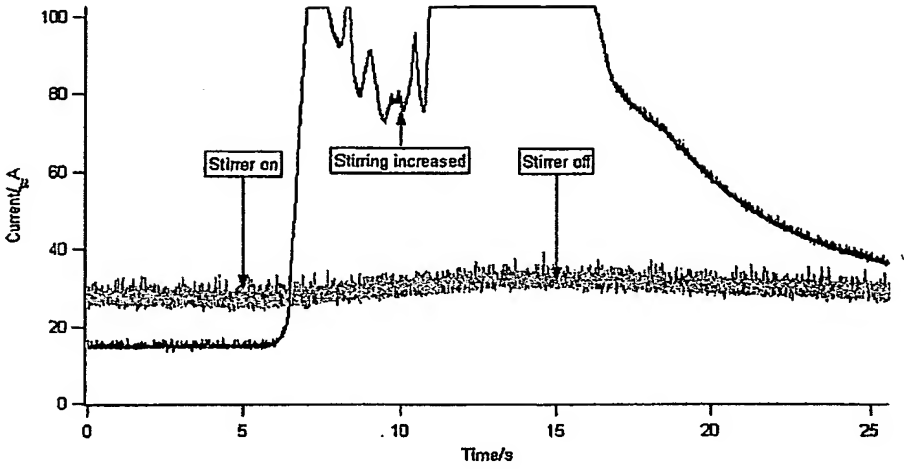
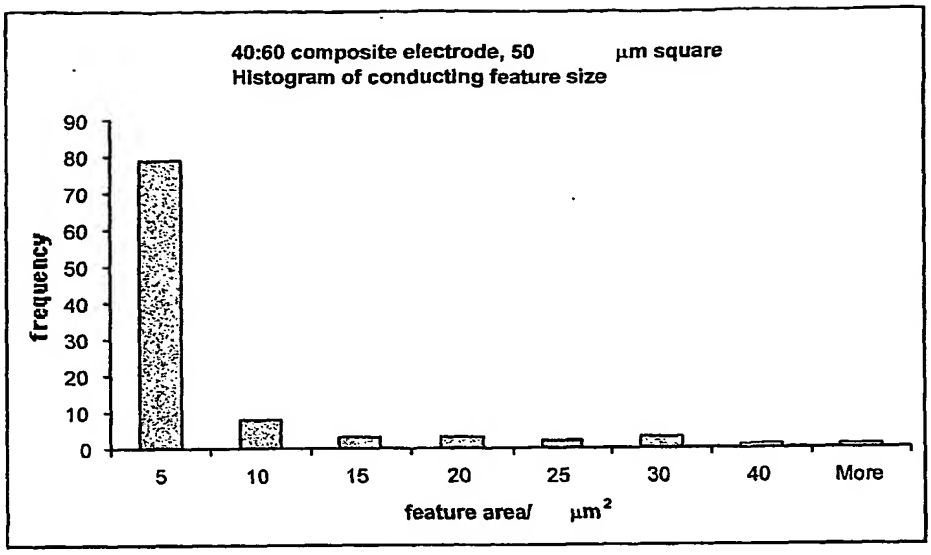


Figure 3

Composition	Area fraction found by C-AFM	Predicted slope of Levich plot/ A (rad $s^{-1})^{-1/2}$	Experimental slope of Levich plot/ A (rad $s^{-1})^{-1/2}$	∴ Area fraction comparable boundary layer
Bulk conductor	1	1.61×10^{-5}	1.61×10^{-5}	-
40% (w/w)	0.25	4.02×10^{-6}	1.28×10^{-6}	0.318
50% (w/w)	0.33	5.31×10^{-6}	1.30×10^{-6}	0.244
60% (w/w)	0.63	1.01×10^{-5}	8.20×10^{-6}	0.81

Figure 4


40:60 composite electrode, 50 µm square
Histogram of conducting feature size
frequency
90
80
70
60
50
40
30
20
10
0
5
10
15
20
25
30
40
More
feature area/ µm²

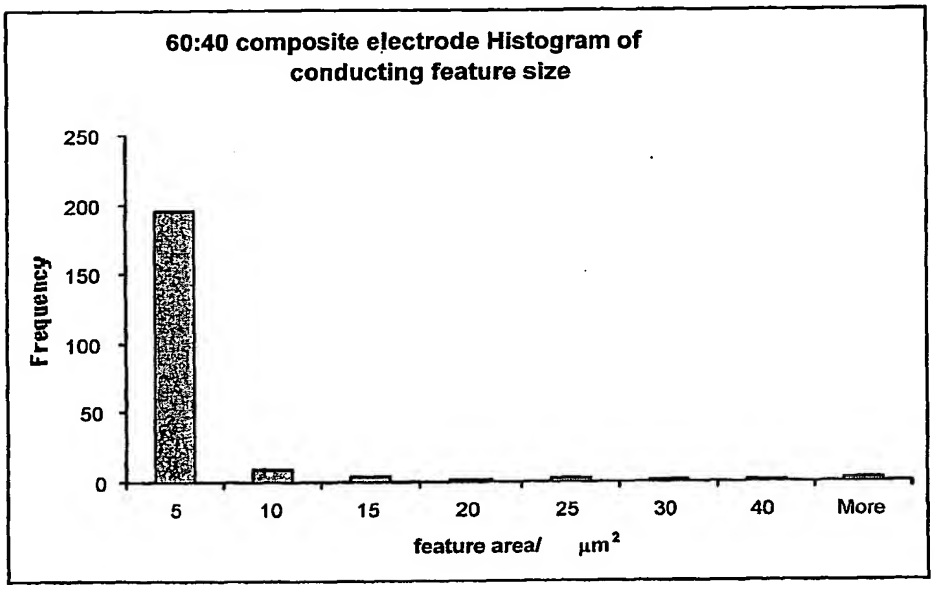

60:40 composite electrode Histogram of conducting feature size
Frequency
250
200
150
100
50
0
5
10
15
20
25
30
40
More
feature area/ µm²

Figure 5

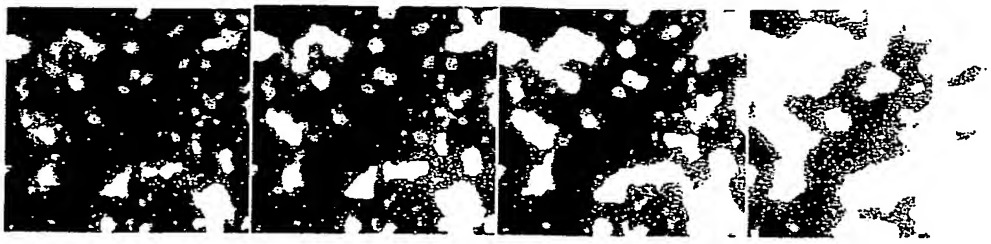


Figure 6

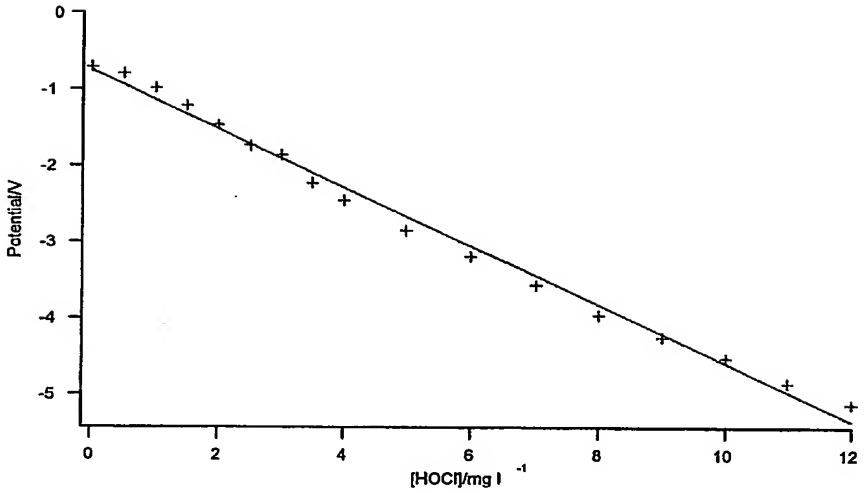


Figure 7

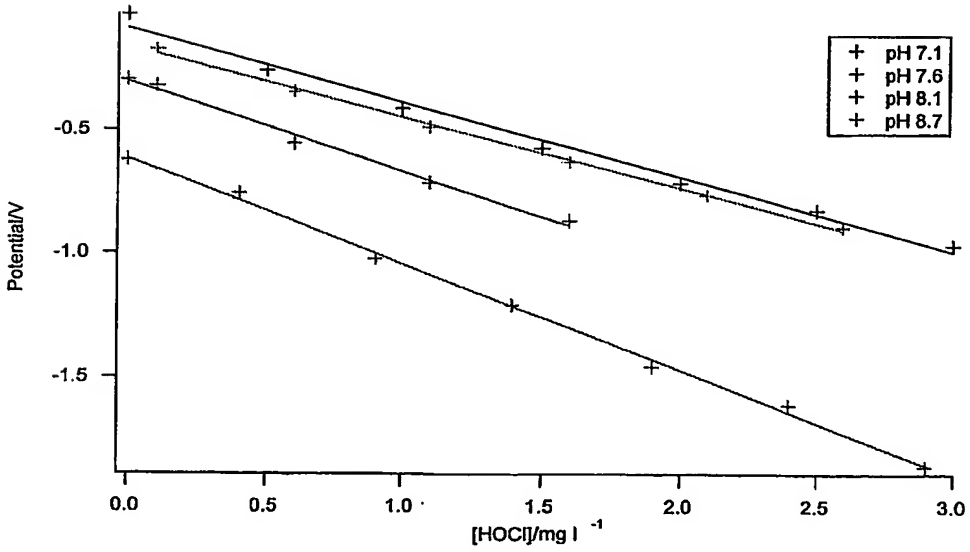
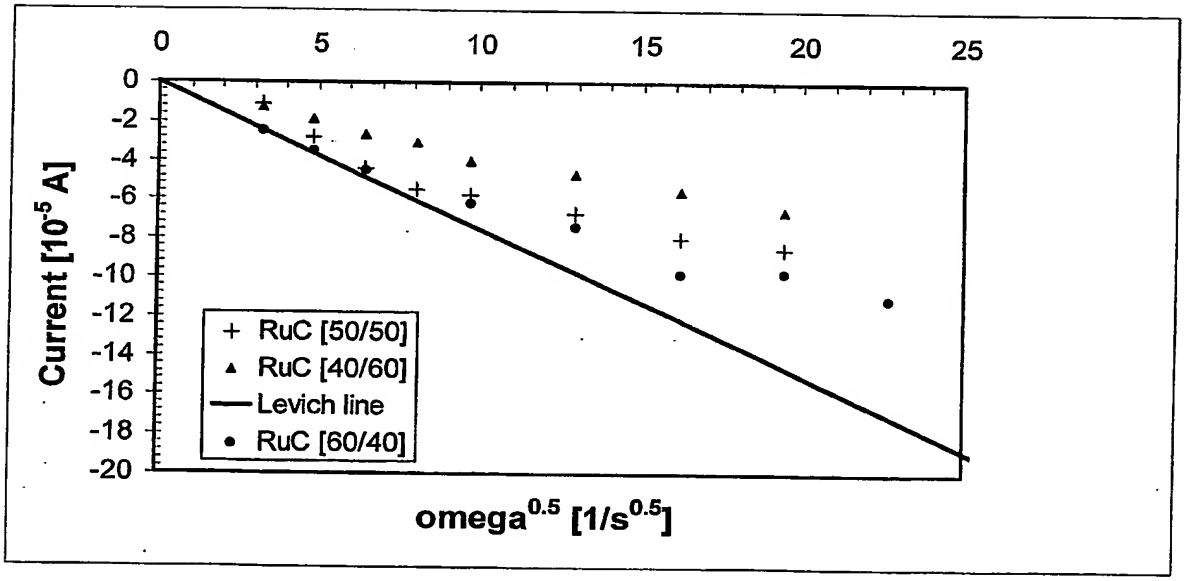


Figure 8

Figure 9


0
5
10
15
20
25
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
Current [10^-5 A]
RuC [50/50]
RuC [40/60]
Levich line
RuC [60/40]
omega^0.5 [1/s^0.5]